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PATENT SPECIFICATION

337,250

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COMPLETE SPECIFICATION.



Improved Rubber-covered Rollers and their Construction.

We, ROBERT WHEATLEY, B.Sc., F.I.C., of Kirtounfield, Davidsons Mains, in the County of Midlothian, a British Subject, and THE VICTORIA RUBBER COMPANY, LIMITED, of Victoria India Rubber Mills, Leith Walk, Edinburgh, in the County of Midlothian, a British Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The Improvements herein referred to, relate to Rubber-covered Rollers, such as are commonly used in Paper-making, Cloth-finishing, Laundering, Printing etc., and have for their object the provision of increased resiliency in the body of the Rubber covering, whilst at the same time retaining the required solidity, or firmness, of the external surface of the rollers.

Stocks or spindles of such Rollers, as hitherto manufactured, are, generally speaking, first covered with a layer of Vulcanite, or Hard Rubber, over which is superimposed a layer, or successive layers of rubber of the required softness or resiliency. After vulcanization, the Rollers are turned, or buffed down in a lathe to the desired diameter. In order to compensate for any bending of the stocks or spindles, when such Rollers are worked under pressure, it is necessary to finish them with a camber. Such compensation can only be approximate, and Rollers so constructed are liable to exert unequal pressure throughout their length, resulting in damage to, or faulty treatment of, material passing over their surface, and eventually, in the destruction of the Rubber covering of the Rollers themselves.

By our invention, we provide a Rubber covering combining with the necessary hardness of surface, sufficient compressibility to correct, or compensate for any tendency towards unequal pressure throughout the length of the Roller.

In carry out our invention, we make use of Sponge Rubber, of the isolated gas filled pore type, and this we incorporate in the body of the Rollers, between the external covering of Solid Rubber and the Stock,

[Price 1/-]

or Spindle. The high compressibility of the Sponge Rubber, depending as it does on its cellular construction, imparts to the outer surface of the Rollers that degree of resiliency, which is required to correct any tendency towards unequal pressure throughout the length of the Rollers.

The relative proportions of the Solid and Sponge Rubbers and their chemical composition, may be varied in such a way as to provide in the Rubber covering the physical properties best suited for the particular purpose for which the Rollers are required.

In its simplest form a Roller may be covered with one layer of Solid Rubber, with an under-lying layer of Sponge Rubber, but there may be more than one layer of Solid Rubber, and more than one layer of Sponge Rubber. In certain cases, the layers of Solid Rubber and Sponge Rubber may be arranged alternately, but we do not limit ourselves to any particular arrangement. It has been proposed to make resilient rolls for Printing Machines by covering a sponge rubber sleeve with the usual gum or composition surface.

Also Rubber-Covered Rollers have been described, containing Sponge Rubber of the free-air type, but this material is not capable of sustaining a heavy load. In Sponge Rubber of this type, the walls of the cells touch during compression, with consequent grinding between them. Ultimately, the Roller covering breaks down, owing to the Sponge being reduced to powder. The Sponge Rubber which we employ is of the type having, in the main, isolated gas-filled pores, in which the volume of air is one half, or less than one half of the volume of the Sponge Rubber, and we restrict our invention to the use of such material as defined. In particular, we have found the types, one of air and one of Rubber, and one of air to two of Rubber, of special service, but we do not limit ourselves to these proportions. The Sponge material we employ is made in sheet form. In connection with the following detailed description, reference should be made to the drawing, Fig. 1 and

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*Vulcanite Roller*

*Leave AW, leave by hand*

Fig. 2. In a particular case, we may allow Rubber, suitably compounded and sheeted,  $\frac{1}{16}$ " thick, to expand during vulcanization to a thickness of  $\frac{1}{8}$ ". The  
 5 Sheets 10 so obtained are cemented with a vulcanizable cement, and placed in position on the base material—consisting of double frictioned cloth—8 (see note below) of the spindle 9. This is again cemented,  
 10 and a layer of solid Rubber 11 built on to the Roller. Vulcanizing is then carried out in the usual manner, the temperature and duration of heating being adjusted so as to effectually vulcanize all  
 15 the parts together, without deteriorating the pre-vulcanized Sponge Rubber. ("Double Frictioned Cloth": Woven fabric which has been coated with rubber on both sides by a Calender running at  
 20 friction speed.)

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

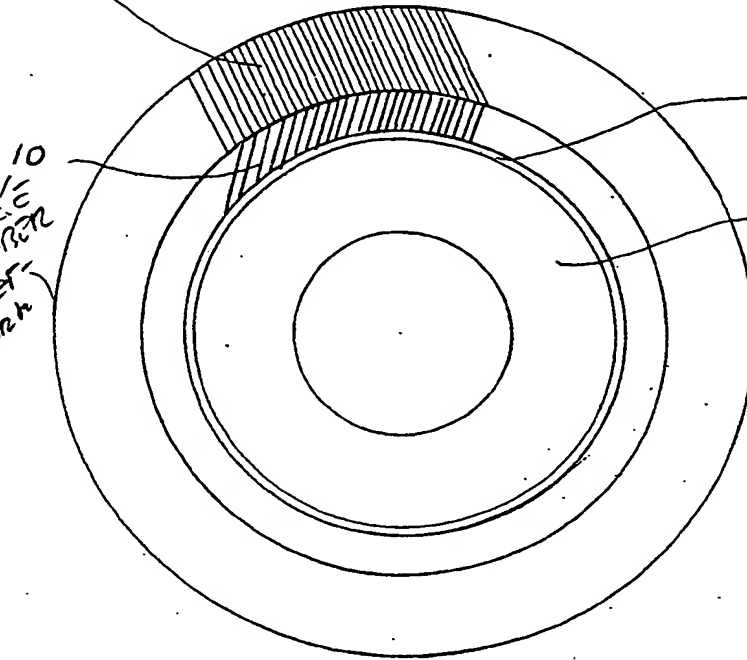
(1). A method of manufacturing a Rubber-Covered Roller, having Sponge Rubber of the isolated gas-filled pore type in the body of the covering, substantially as described.

(2). A Rubber-Covered Roller manufactured, as set forth in claim No. 1.

Dated the 29th day of May, 1930.  
 R. WHEATLEY,  
 THE VICTORIA RUBBER COMPANY  
 LIMITED,  
 For The Victoria Rubber Co. Limited,  
 PAT. MILLAR MATTHEW,  
 Managing Director.

SOLID RUBBER

11



8 - DOUBLE FRICTION CLOTH

9 - SPINDLE

10 - PONGE RUBBER (1/2" THICK)

FIG 1

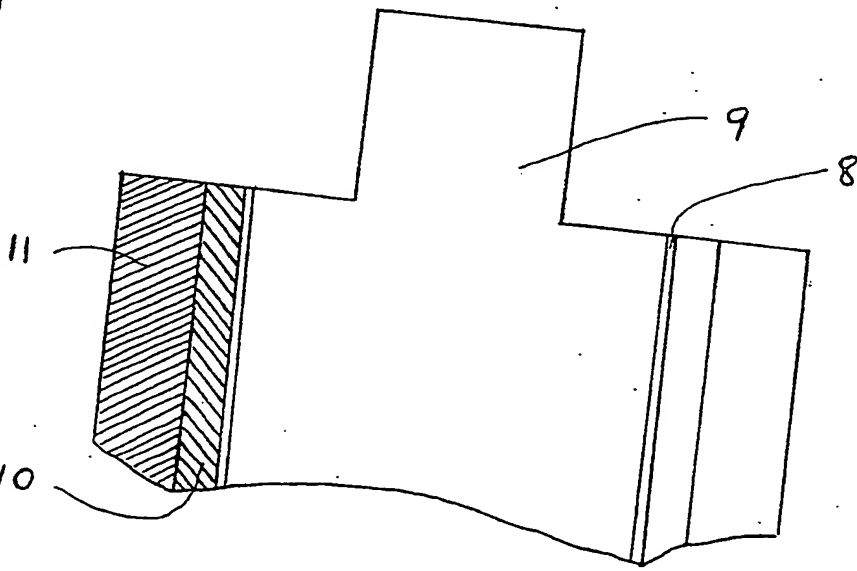


FIG 2

[This Drawing is a reproduction of the Original on a reduced scale.]

Charles & Read Ltd. Photo Litho.